1   1.   A method of block diagram modeling in a data processing system, comprising:

2   in a first block, receiving a first value indicative of an index into a lookup table;

3   in the first block, generating information indicative of the location of the first value

4   relative to a predefined domain of possible indexed values that define regions;

5   in a second block, receiving the information generated by the first block; and

6   using the information received in the second block to determine an output value of a

7   first lookup table.

1   2.   The method of claim 1, wherein the generated information comprises information

2   identifying a region of the predefined domain within which the first value falls.

1   3.   The method of claim 2, wherein the generated information further comprises

2   information identifying a position of the first value within the identified segment.

1   4.   The method of claim 1, further comprising:

2   in a third block different from the second block, receiving the information generated

3   by the first block; and

4   using the information received in the third block to determine an output value of a

5   second lookup table different from the first lookup table.

1   5.   The method of claim 1, further comprising:

2   in a fourth block, receiving a second value indicative of an index into a lookup table;

3   in the fourth block, generating information indicative of the location of the second

4   value relative to a predefined domain of possible index values;

5   in the second block, receiving the information generated by the fourth block; and

6   using the information received in the second block from the first block and the fourth

7   block to determine an output value of the first lookup table.

1   6.   The method of claim 1, wherein the first and fourth blocks are two of N index search

2   blocks used to perform an N-dimensional interpolation, further comprising:

3   in each of the N index search blocks, receiving a value indicative of an index into the

4   lookup table and corresponding to a different one of N dimensions;

5   in each of the N index search blocks, generating information indicative of the location

6   of such value relative to the predefined domain of possible index values; and

7   in the second block, receiving the information generated by each of the N index

8   search blocks; and

9   using the information received in the second block to determine an output value of the

10 first lookup table.

1   7.   The method of claim 1, wherein determining an output value of the first lookup table

2   comprises using the information received in the second block to interpolate values in a

3   lookup table.

1   8.   The method of claim 1, further comprising:

2   maintaining in a block library a pre-lookup index search block and an interpolation

3   block that uses output of the pre-lookup index search block for interpolated table lookup; and

4   instantiating the index search block to create the first block and instantiating the

5   interpolation block to create the second block.

1   9.   The method of claim 8, further comprising:

2   receiving parameters from a user to instantiate the pre-lookup index search block and

3   the interpolation block.

1   10.   The method of claim 9, wherein receiving comprises providing the user with a dialog

2   box having fields for specifying values of the parameters for the pre-lookup index search

3   block.

1   11.   The method of claim 9, wherein receiving comprises providing the user with a textual

2   API for programmatically specifying values of the parameters.

3   12.   The method of claim 10, wherein the parameters for the pre-lookup index search

4   block comprise breakpoint data.

1   13.   The method of claim 9, wherein receiving comprises providing the user with a dialog

2   box having fields for specifying values of the parameters for the interpolation block.

1   14.   The method of claim 13, wherein the parameters for the interpolation block comprise

2   table data.

1   15.   The method of claim 6, wherein the generated information comprises a breakpoint

2   data set index value and a distance fraction value for each dimension and corresponding input

3   value chosen by the user.

1   16.   The method of claim 1, comprising:

2   using the graphical block diagram of the graphical block diagram model as a

3   specification for interpretation by automatic code generation software that generates code to

4   perform computations equivalent to computations performed by the graphical block diagram

5   model.

1   17.   A method of graphical block diagram processing, comprising;

2   receiving as an input a block diagram model that includes interpolation lookup blocks

3   which each perform index search operations and interpolated table lookup;

4   detecting if the interpolation lookup blocks have shared input values and breakpoint

5   data sets; and

6   interpreting the block diagram model as if the block diagram model included separate

7   index search blocks and interpolated lookup blocks.

1   18.   The method of claim 17, further comprising using the interpreted graphical block

2   diagram by automatic code generation software that generates code to perform computations

3   equivalent to computations performed by the graphical block diagram model.

16

1   19.   A method of graphical block diagram processing, comprising:

2   maintaining in a block library an index search block and an interpolation block that

3   uses output of one or more pre-lookup index search blocks; and

4   enabling a user to use the pre-lookup index search and interpolation blocks to build a

5   graphical block diagram model.

1   20.   A computer program product residing on a computer-readable medium for block

2   diagram modeling, the computer program product comprising instructions causing a

3   computer to:

4   in a first block, receive a first value indicative of an index into a lookup table;

5   in the first block, generate information indicative of the location of the first value

6   relative to a predefined domain of possible indexed values;

7   in a second block, receive the information generated by the first block; and

8   use the information received in the second block to determine an output value of a

9   first lookup table.

1   21.   A computer system comprising:

2   in a first block, means for receiving a first value indicative of an index into a lookup

3   table;

4   in the first block, means for generating information indicative of the location of the

5   first value relative to a predefined domain of possible indexed values;

6   in a second block, means for receiving the information generated by the first block;

7   and

8   means for using the information received in the second block to determine an output

9   value of a first lookup table.